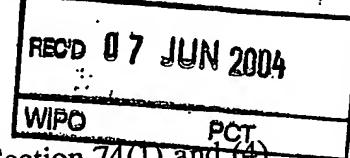




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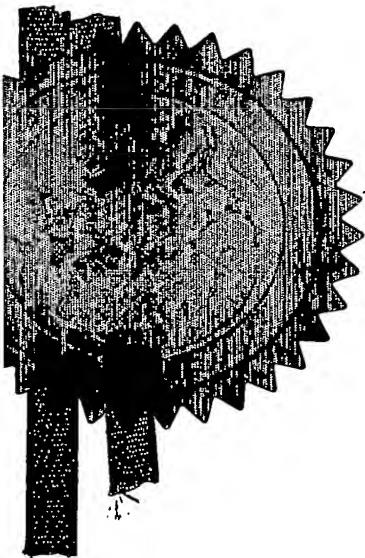


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Signed

Dated

*Stephen Hordley*  
26 May 2004

17 APR 2003

NEWPORT

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1. Your reference

J09/B01

2. Patent application number

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0308932.3

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)

(1) Glynn HUMPHRIES and  
(2) Christopher John JACKSON

(1) 2 Oak Rise, Pontefract, West Yorkshire, WF8 2WD, United Kingdom and  
(2) Southgate, Crossways, Winchester, SO21 2BZ, United Kingdom

Patents ADP number (*If you know it*)

① 08446457001      ② 8613051001

Storage and transportation of recyclable waste

4. Title of the invention

Ken Targett

5. Name of your agent (*If you have one*)

48 Meadowsweet Way, Horton Heath, Hampshire, SO50 7PD

"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

Patents ADP number (*If you know it*)

06777791001 ✓

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*If you know it*) the or each application number

Country	Priority application number ( <i>If you know it</i> )	Date of filing ( <i>day / month / year</i> )
United Kingdom	0219079.1	16 August 2002

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

Yes

- a) any applicant named in part 3 is not an inventor, or
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Letter, PF21/77 and PF51/77 all in respect of the priority application ✓

11.

I/We request the grant of a patent on the basis of this application.

Signature

Date

16 April 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Ken Targett. Tel: 023 8060 1386

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CONFIDENTIAL

TITLE

Storage and transportation of recyclable waste

DESCRIPTION

This invention relates generally to the storage and transportation of recyclable waste, and more particularly to an apparatus for use in the storage and transportation of recyclable waste, a method of manufacture of such an apparatus, a method of collection of recyclable waste from a neighbourhood of residential properties, and to such a neighbourhood per se.

5        In years gone past, little recycling of domestic refuse was carried out, and the Earth's resources were wasted. More recently, recycling has become more popular, and in the UK, for example, there are government incentives such as landfill tax and targets to encourage recycling. In the UK some years ago, bottle banks and paper banks were set up in many areas, and householders were requested to take their waste glass, paper and cardboard to such banks. Such schemes had  
10      limited success because householders had to go out of their way to recycle their waste. In many boroughs in the UK, wheelie bins (see Figure 1 of the accompanying drawings) are now used for the storage and collection of refuse, and in some boroughs two wheelie bins are provided for each household, usually a green bin for certain types of recyclable waste and a black bin for other waste.  
15      After collection, the contents of the green bins are sorted by the local authority (or their contractor) into the different categories of recyclable material, for example different colours of glass, paper and card, ferrous metal, aluminium, other metals and plastics. A considerable amount of sorting needs to be carried out by the local authority. Some local authorities have attempted to involve householders more in the sorting process by providing several recycling boxes (smaller than a wheelie bin or old-fashioned dustbin and each typically having a capacity of 40 to 60 litres – see Figure 2 of the  
20      accompanying drawings) for each household and persuading householders to separate out, from their general waste, recyclables such as glass, paper and card, recyclable plastics, and cans and other metal waste. These schemes are meeting with greater success than the bottle and paper banks, because the householder does not need to leave their property as part of the process, because the local authority can impose the sanction of refusing to collect refuse that had not been properly sorted and because  
25      the idea of recycling has now caught on more. It is estimated that, at the time of drafting of this specification (April 2003), there are in excess of ten million such recycling boxes in use in the United Kingdom.

There are, however, problems with the recycling box schemes. The boxes are normally kept out-of-doors, where they and/or their contents can be blown around by the wind. If lids are provided  
30      for the boxes, they can be blown away and lost, or used by children like a Frisbee®. Without a lid, the

recyclables get wet in the rain and so paper and card get sodden and ferrous metals go rusty, and pets use the boxes for their toilet. On collection day, the boxes need to be lifted and carried from their normal storage place, for example on the ground outside the back door, to the collection point, for example on the pavement outside the house. The boxes are usually stored next to each other on the ground and take up a significant amount of ground area.

The present invention, or at least specific embodiments of it, addresses these problems associated with recycling box schemes.

In accordance with one aspect of the present invention, there is provided an apparatus for use in the storage and transportation of recyclable waste, the apparatus comprising a housing having a bottom for standing on the ground, a rear wall, a pair of opposed side walls, a handle adjacent the top and rear of the housing, a pair of wheels adjacent the bottom and rear of the housing arranged such that the housing can be tipped rearwardly using the handle so that the wheels engage the ground, so that the bottom of the housing no longer engages the ground and so that the apparatus can be moved on the wheels using the handle to move it, the housing providing at least one compartment accessible from the front of the housing, the or each compartment being arranged to receive a respective recycling box having a base, four side walls and an open top such that the or each recycling box can be slid into the housing from the front, such that when the or each recycling box is in the housing the top of that recycling box is covered by a portion of the housing or by the base of the recycling box above that recycling box and the front-facing side walls of the recycling box(es) substantially close the front of the housing. When the recycling box(es) are slid into the housing, they are therefore covered and their contents are protected from the elements, and they can be moved by a householder on collection day without any need for lifting.

The housing preferably provides a plurality of such compartments arranged one above another in the housing so that the housing can take up less ground area than the ground area that would be taken up by a plurality of recycling boxes arranged side-by-side on the ground.

In one embodiment, the housing provides a shelf beneath the or each compartment onto which the respective recycling box can be slid. The compartment can therefore accept a range of sizes of recycling box. However, if the apparatus is to be used only with recycling boxes of one particular size, in another embodiment, the housing provides a pair of runners to either side of the or each compartment onto which opposed lips of the respective recycling box be slid.

The top of the housing preferably has a hinged lid providing access to a further, top compartment of the housing. In this case, the sides of the top compartment may be provided by the rear wall, the side walls and a front wall of the housing. Alternatively, the top compartment may be

arranged to receive a removable recycling tray, or may have a base and side walls to form an integral recycling tray.

In one embodiment, the housing is formed as a single plastics moulding.

In another embodiment, the housing is formed as a first plastics moulding providing the side walls and a rear wall of the housing, and a second plastics moulding joined to the first moulding for defining the compartment(s). In this case, the first plastics moulding may be substantially identical to a standard wheelie bin except for the omission of at least part of the front wall thereof. If a wheelie bin mould is already available, this therefore reduces the tooling-up costs. The second moulding preferably has a least one open-fronted box portion and a flange around the open front of the box portion for abutting the first moulding, and the box portion preferably has converging walls so that, prior to assembly of the first and second mouldings, a plurality of such second mouldings can be stacked one inside the next. This enables space to be saved during transportation between the factory and the place of assembly of the mouldings.

In accordance with a second aspect of the invention, there is provided an apparatus according to the first aspect of the invention, in combination with at least one such recycling box. Of course, in the case where more than one compartment is provided, a corresponding number of such recycling boxes are preferably also provided. In this case, the recycling boxes preferably have substantially identical sizes.

The or each recycling box may be a standard recycling box, for example having a volumetric capacity in the range of 40 to 60 litres (and more preferably in the range of 50 to 60 litres), an external height in the range of 0.26 to 0.36 m, an external width in the range of 0.38 to 0.48 m and/or an external length in the range of 0.51 to 0.63 m.

In the case where the housing provides a pair of runners to either side of the or each compartment, the or each recycling box preferably has a pair of opposed lips along the upper edges of an opposed pair of side walls of that box for engaging the pair of runners of the respective compartment.

In the case where the first plastics moulding is substantially identical to a standard wheelie bin except for the omission of at least part of the front wall thereof, a third aspect of the invention provides a method of manufacture of such an apparatus, the method comprising the steps of moulding a standard wheelie bin, removing at least part of the front wall therefrom to form the first moulding, moulding the second moulding, and joining the first and second mouldings. A main part, if not the majority, of the apparatus can therefore be moulded using an existing mould.

Alternatively, a fourth aspect of the invention provides a method of manufacture of such an apparatus, the method comprising the steps of modifying a mould for a standard wheelie bin so that the mould produces a first moulding substantially identical to a standard wheelie bin except for the omission of at least part of the front wall thereof, moulding the second moulding, and joining the first and second mouldings. A main part, if not the majority, of the apparatus can therefore be moulded using an existing mould with only minor modification.

In accordance with a fifth aspect of the invention, in a neighbourhood of residential properties, at least the majority of the properties are each provided with a respective apparatus according to the first or second aspect of the invention. At least some, if not all, of the apparatuses 10 are preferably identical.

In accordance with a sixth aspect of the invention, there is provided a method of collection of recyclable waste from a neighbourhood of residential properties, the method comprising the steps of providing at one time at least some of the properties each with at least one recycling box, then collecting recyclable waste from the recycling boxes, providing at a subsequent time (which may be a 15 year or more later) those properties each with an apparatus according to the first aspect of the invention so that the apparatus and existing recycling box(es) at each of those properties form an apparatus according to the second aspect of the invention, and then collecting recyclable waste from the apparatuses. In other words, in order to obtain the benefits of the invention, it is possible to use existing recycling boxes, estimated to number in excess of ten million in the United Kingdom in April 20 2003.

Specific embodiments of the present invention will now be described, purely by way of example, with reference to the accompanying drawings, all of which are isometric views, and in which:

- Figure 1 shows a conventional wheelie bin;
- 25 Figure 2 shows a conventional recycling box;
- Figure 3 shows a modified form of the wheelie bin of Figure 1;
- Figure 4 shows a moulding used with the modified wheelie bin of Figure 3 to form a first embodiment of the invention;
- Figure 5 shows the apparatus of the first embodiment of the invention, with one recycling 30 box omitted;
- Figure 6 shows a stack of the mouldings of Figure 4;

Figure 7 shows a second embodiment of the invention;

Figure 8 shows a third embodiment of the invention; and

Figure 9 shows a fourth embodiment of the invention.

Referring to Figures 1 to 5 of the drawings, the first embodiment of the invention as shown in Figure 5 employs a conventional standard wheelie bin 10 as shown in Figure 1, three conventional standard recycling boxes 12 as shown in Figure 2 and an additional compartment moulding 14 as shown in Figure 4.

As is well-known, the wheelie bin 10 has a base 16, a front wall 18, a rear wall 20, a pair of side walls 22, a lid 24 that is hinged to the top of the rear wall 20 by an arrangement that provides a pair of handles 26, and a pair of wheels 28 on a common axis adjacent the bottom of the rear wall 20. The front and rear walls 18, 20 and the side walls 22 converge slightly towards the base 16 so that, with the lids 24 open and wheels 28 removed, a plurality of such wheelie bins 10 can be stacked one inside the next to save space during transportation between the factory and the end-user. As is also well-known, each recycling box 12 is open-topped and has a base 30, four side walls 32 and an outwardly-extending lip 33 around the tops of the side walls 32. Again, the side walls 32 converge slightly towards the base 30 so that plurality of such recycling boxes 12 can be stacked one inside the next to save space during transportation between the factory and the end-user. Typically, the recycling box 12 would have a capacity of 53 litres and external dimensions WxLxH of 440 mm x 570 mm x 330 mm.

The compartment moulding 14 is formed as three similar open-fronted boxes 34 each having a base 36, a top wall 38, a pair of side walls 40 and a rear wall. The boxes 34 are integrally joined together in a row by a flange portion 44 around the open fronts of the boxes 34. Each open-fronted box 34 is sized interiorly to accommodate a recycling box 12 and for the recycling box described above may have an interior width, depth and height of 480 mm x 570 mm x 360 mm.

In order to provide the first embodiment of the invention, three rectangular holes 46 are cut, one above another, in the front wall 18 of the wheelie bin 10, as shown in Figure 3. The holes 46 have a vertical pitch equal to the vertical pitch of the boxes 34 of the compartment moulding 14. The width of each hole 46 is slightly larger than the exterior width of each box 34 immediately behind the flange portion 44, and the height of each hole 46 is slightly larger than the exterior height of each box 34 immediately behind the flange portion 44. The compartment moulding 14 is assembled with the wheelie bin 10 by inserting the boxes 34 into the holes 46 and fixing the flange portion 44 to the front wall 18 of the wheelie bin 10, for example with adhesive, welding, snap-fit formations or screws. Accordingly, as shown in Figure 5, three vertically-aligned, open-fronted compartments 48 are provided in the wheelie bin 10, into each of which a respective recycling box 12 can be slid, being

supported by the base 36 of the respective open-fronted box. When all three recycling boxes 12 are fully inserted into their compartments, the front walls 32 of the boxes 12 substantially close the front wall 18 of the wheelie bin 10. The top of each recycling box 12 is covered by the respective top wall 38 of the respective open-fronted box 34 to protect the contents of the recycling box 12 from the elements. By being shrouded by the wheelie bin 10, the recycling boxes 12 are unlikely to be blown away in the wind.

As shown in Figure 6, the base 36, top 38 and side walls 40 of each open-fronted box 34 of the compartment moulding 14 converge slightly towards the rear wall so that a plurality of such compartment mouldings 14 can be stacked one inside the next to save space during transportation between the factory and the place of assembly of the compartment mouldings 14 with the wheelie bins 10.

In a modification to the first embodiment, instead of the three holes 46 being cut in the front wall 18 of the conventional wheelie bin 10, the mould for the wheelie bin 10 is modified so that the holes 46 are formed at the time of moulding of the wheelie bin 10.

The second embodiment of the invention, as shown in Figure 7, is similar to the first embodiment except that the mould for the wheelie bin is modified so that the bases 36, tops 38, side walls 40 and rear walls of the compartments 48 are integrally moulded with the housing for the wheelie bin 10. Also, a shallow tray 50 at the top of the wheelie bin 10 is integrally moulded with front, rear wall and side walls 18,20,22 and is accessible by lifting the lid 24.

The third embodiment of the invention, as shown in Figure 8, is similar to the second embodiment except that, instead of providing a base 36, top 38, side walls 40 and rear wall for each compartment 48, a pair of generally-horizontal, mutually-parallel runners 52 are provided extending rearwardly from the respective hole 46 in the front wall 18 of the wheelie bin 10. The spacing of the runners 52 is such that they can support the recycling boxes 12 beneath their lips 33 and allow the recycling boxes 12 to be slid in and out. Also, in the third embodiment, the top tray 50 is removable and has a pair of lifting handles 54.

The fourth embodiment of the invention, as shown in Figure 9, uses the technique of the third embodiment to provide a single recycling box 12 on runners 52 near the bottom of the wheelie bin 10 and includes a horizontal partition, as indicated by the dash-dot line 56, immediately above the recycling box 12 so that the space 58 above the partition 56 can be used for general refuse.

Various modifications and developments may be made to the embodiments of the invention described above. For example, in the case where the local authority does not collect all types of recyclable waste on the same day, the side of the bin 10 may be provided with a pouch into which the collector can slip a card listing the collection dates and the types of waste collected on each date. One

or more of the recycling boxes 12 may be provided with one or more vertical partition walls so that it can be used for more than one type of recyclable waste. The lid 24 of the bin 10 may be flat and may be used by the collector as a platform on which to place the recycling boxes while their contents are checked. One or more hooks may be provided on the bin, for example near the handle, onto which bags of other types of recyclable waste could be hung ready for collection. For example, local authorities could provide residents with distinctive bags for use when disposing of batteries.

It should be noted that the embodiments of the invention have been described above purely by way of example and that many modifications and developments may be made thereto within the scope of the present invention.

CLAIMS

*(The reference numerals and figure numbers appearing in parentheses in the claims  
are not intended to limit the scope of the protection sought or granted.)*

1. An apparatus for use in the storage and transportation of recyclable waste, the apparatus comprising a housing (10) having a bottom (16) for standing on the ground, a rear wall (20), a pair of opposed side walls (22), a handle (26) adjacent the top and rear of the housing, a pair of wheels (28) adjacent the bottom and rear of the housing arranged such that the housing can be tipped rearwardly  
5 using the handle so that the wheels engage the ground, so that the bottom of the housing no longer engages the ground and so that the apparatus can be moved on the wheels using the handle to move it, the housing providing at least one compartment (48) accessible from the front of the housing, the or each compartment being arranged to receive a respective recycling box (12) having a base (30), four side walls (32) and an open top such that the or each recycling box can be slid into the housing  
10 from the front, such that when the or each recycling box is in the housing the top of that recycling box is covered by a portion of the housing or by the base of the recycling box above that recycling box and the front-facing side walls of the recycling box(es) substantially close the front of the housing.
2. An apparatus as claimed in claim 1, wherein the housing provides a plurality of such compartments arranged one above another in the housing.  
15
3. An apparatus as claimed in claim 1 or 2, wherein the housing provides a shelf (36) beneath the or each compartment onto which the respective recycling box can be slid.
4. An apparatus as claimed in claim 1 or 2, wherein the housing provides a pair of runners (52) to either side of the or each compartment onto which opposed lips (33) of the respective recycling box be slid.  
20
5. An apparatus as claimed in any preceding claim, wherein the top of the housing has a hinged lid (24) providing access to a further, top compartment (50;58) of the housing.
6. An apparatus as claimed in claim 5, wherein the sides of the top compartment are provided by the rear wall, the side walls and a front wall of the housing (Figure 9).
- 25 7. An apparatus as claimed in claim 5, wherein the top compartment is arranged to receive a removable recycling tray (50 - Figure 8).

8. An apparatus as claimed in claim 5, wherein the top compartment has a base and side walls to form an integral recycling tray (50 – Figure 7).
9. An apparatus as claimed in any preceding claim, wherein the housing is formed as a single plastics moulding (Figures 7 to 9).
- 5 10. An apparatus as claimed in any of claims 1 to 8, wherein the housing is formed as a first plastics moulding (10) providing the side walls and a rear wall of the housing, and a second plastics moulding (14) joined to the first moulding for defining the compartment(s) (Figures 3 to 5).
- 10 11.. An apparatus as claimed in claim 10, wherein the first plastics moulding is substantially identical to a standard wheelie bin except for the omission of at least part of the front wall (18) thereof.
12. An apparatus as claimed in claim 10 or 11, wherein the second moulding has a least one open-fronted box portion (34) and a flange (44) around the open front of the box portion for abutting the first moulding.
- 15 13. An apparatus as claimed in claim 12, wherein the box portion has converging walls (36,38,40) so that, prior to assembly of the first and second mouldings, a plurality of such second mouldings can be stacked one inside the next (Figure 6).
14. An apparatus as claimed in any preceding claim, in combination with at least one such recycling box (12).
- 20 15. An apparatus as claimed in claim 14 when dependent directly or indirectly on claim 2, wherein there is a plurality of such recycling boxes.
16. An apparatus as claimed in claim 15, wherein the recycling boxes have substantially identical sizes.
17. An apparatus as claimed in any of claims 12 or 16, wherein the or each recycling box has a volumetric capacity in the range of 40 to 60 litres.
- 25 18. An apparatus as claimed in any of claims 12 to 17, wherein the or each recycling box has an external height (H) in the range of 0.26 to 0.36 m.
19. An apparatus as claimed in any of claims 12 to 18, wherein the or each recycling box has an external width (W) in the range of 0.38 to 0.48 m.
20. An apparatus as claimed in any of claims 12 to 19, wherein the or each recycling box has an 30 external length (L) in the range of 0.51 to 0.63 m.

21. An apparatus as claimed in any of claims 12 to 20 when directly or indirectly dependent on claim 4, wherein the or each recycling box has a pair of opposed lips (33) along the upper edges of an opposed pair of side walls (32) of that box for engaging the pair of runners (52) of the respective compartment.
- 
- 5 22. An apparatus for use in the storage and transportation of recyclable waste, substantially as described with reference to the drawings.
23. A method of manufacture of an apparatus as claimed in claim 11, or any of claims 12 to 21 when dependent on claim 11, the method comprising the steps of moulding a standard wheelie bin (10 – Figure 1), removing at least part of the front wall (18) therefrom to form the first moulding, 10 moulding the second moulding (14), and joining the first and second mouldings.
24. A method of manufacture of an apparatus as claimed in claim 11, or any of claims 12 to 21 when dependent on claim 11, the method comprising the steps of modifying a mould for a standard wheelie bin so that the mould produces a first moulding (10 – Figure 3) substantially identical to a standard wheelie bin except for the omission of at least part of the front wall (18) thereof, moulding 15 the second moulding (14), and joining the first and second mouldings.
25. A method of manufacture of an apparatus for use in the storage and transportation of recyclable waste, substantially as described with reference to the drawings.
26. A neighbourhood of residential properties, at least the majority of the properties each being provided with a respective apparatus as claimed in any of claims 1 to 22.
- 20 27. A neighbourhood as claimed in claim 26, wherein at least some of the apparatuses are identical.
28. A method of collection of recyclable waste from a neighbourhood of residential properties, the method comprising the steps of providing at one time at least some of the properties each with at least one recycling box (12), then collecting recyclable waste from the recycling boxes, providing at a 25 subsequent time those properties each with an apparatus as claimed in any of claims 1 to 11 so that the apparatus and existing recycling box(es) at each of those properties form an apparatus as claimed in any of claims 12 to 21, and then collecting recyclable waste from the apparatuses.
29. A method as claimed in claim 28, wherein said subsequent time is at least one year after said one time.

TITLE

Storage and transportation of recyclable waste

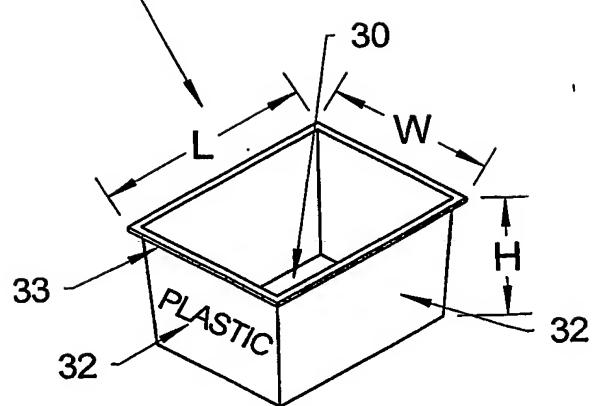
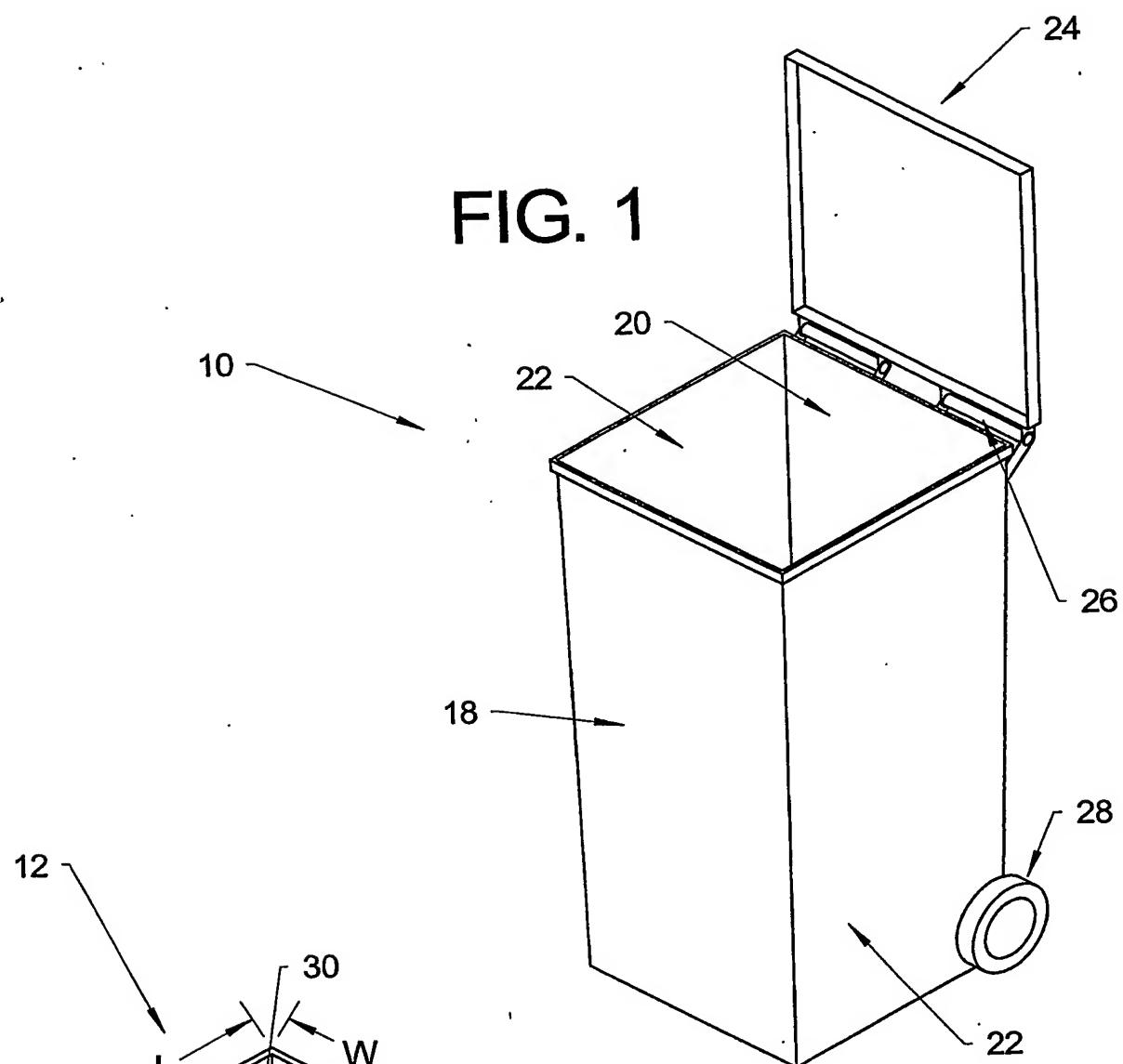
ABSTRACT

An apparatus for use in the storage and transportation of recyclable waste comprises a housing (10) having a bottom for standing on the ground, a rear wall, a pair of opposed side walls (22), a handle (26) adjacent the top and rear of the housing, a pair of wheels (28) adjacent the bottom and rear of the housing arranged such that the housing can be tipped rearwardly using the handle so 5 that the wheels engage the ground, so that the bottom of the housing no longer engages the ground and so that the apparatus can be moved on the wheels using the handle to move it, the housing providing at least one compartment (48) accessible from the front of the housing, the or each compartment being arranged to receive a respective recycling box (12) having a base, four side walls and an open top such that the or each recycling box can be slid into the housing from the front, such 10 that when the or each recycling box is in the housing the top of that recycling box is covered by a portion of the housing or by the base of the recycling box above that recycling box and the front-facing side walls of the recycling box(es) substantially close the front of the housing. Existing recycling boxes can be used. When the recycling box(es) are slid into the housing, they are covered and their contents are protected from the elements, and they can be moved by a householder on 15 collection day without any need for lifting.

Figure 5

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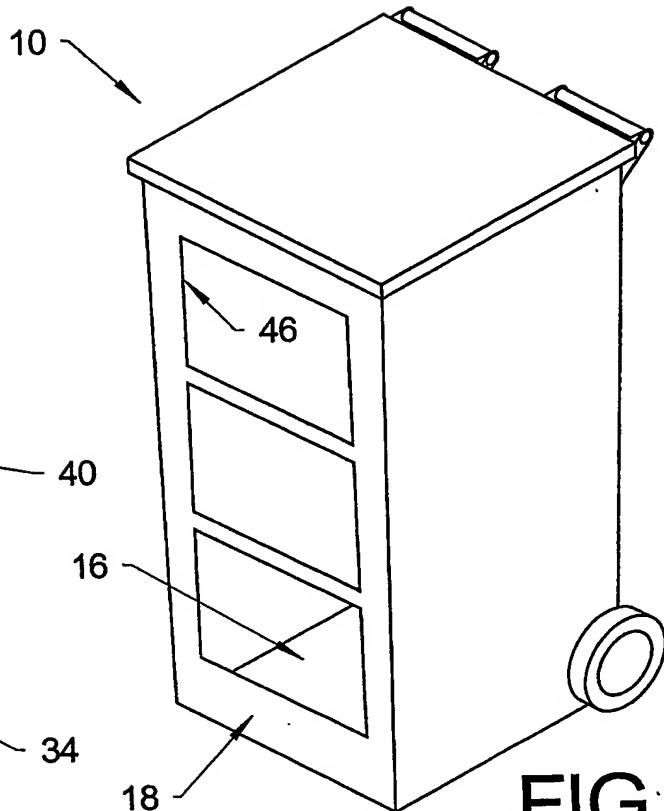
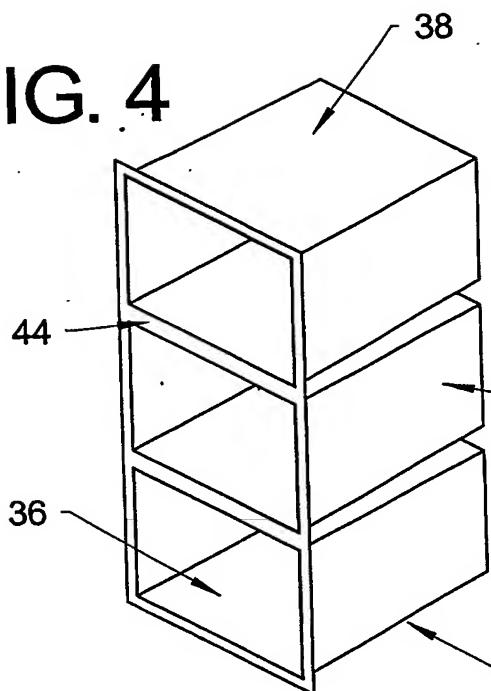
**FIG. 1**



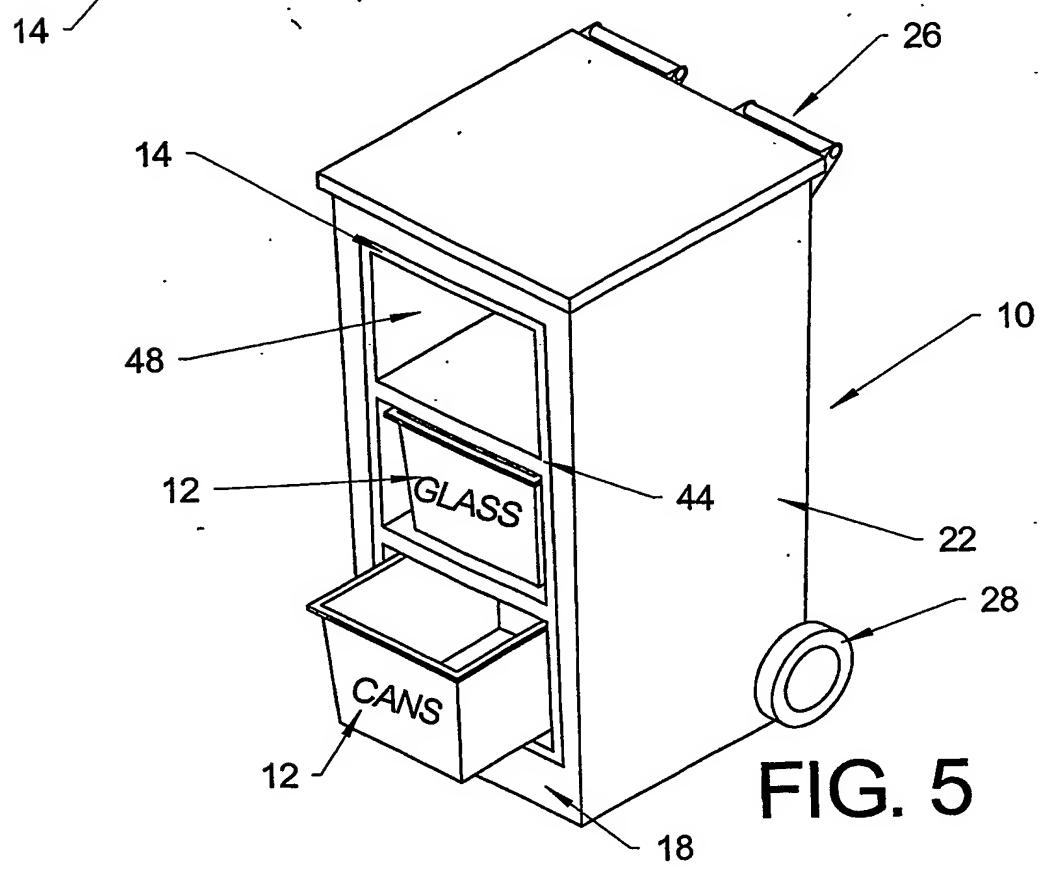
**FIG. 2**

2/4

**FIG. 4**

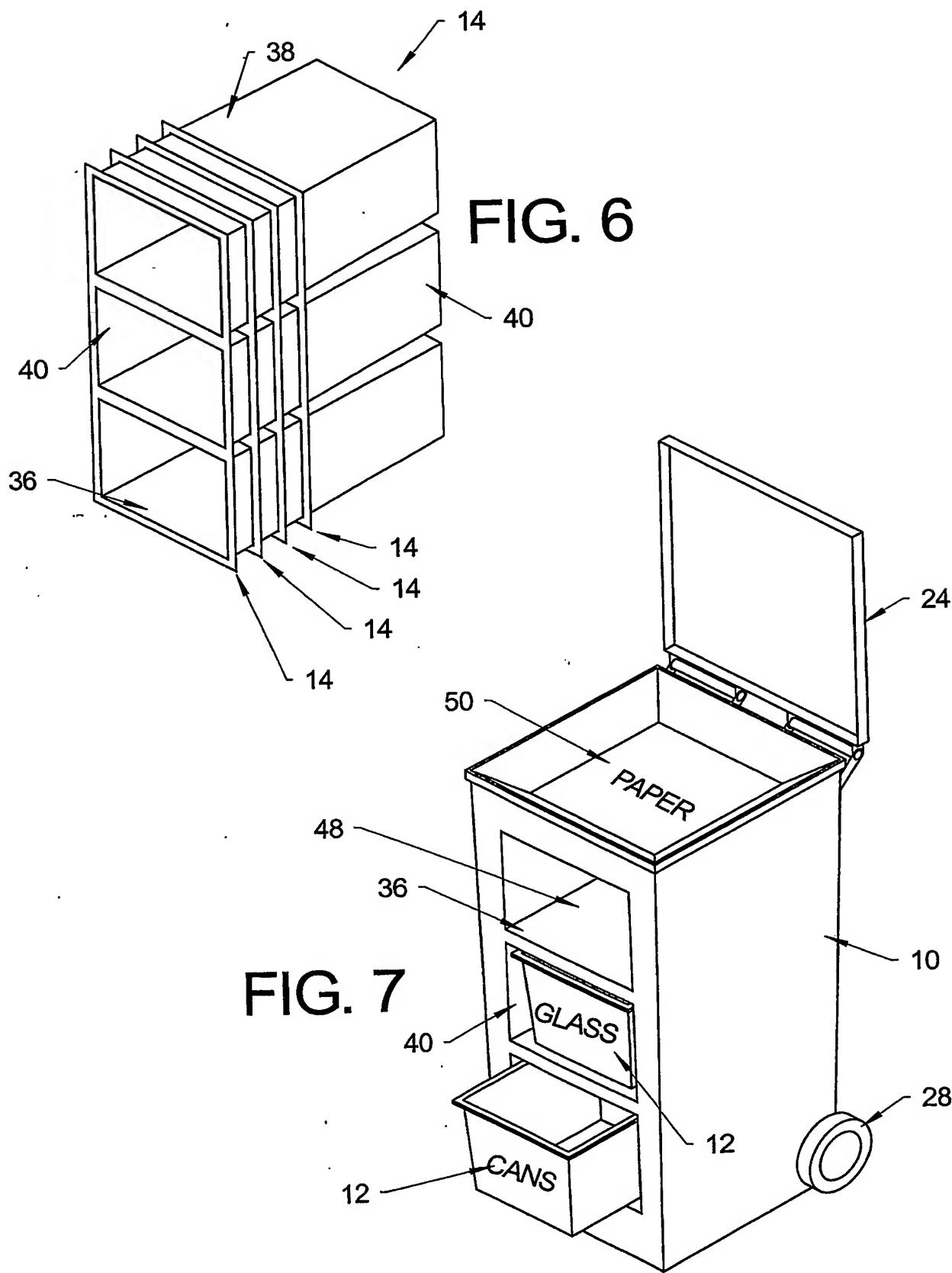


**FIG. 3**



**FIG. 5**

3/4



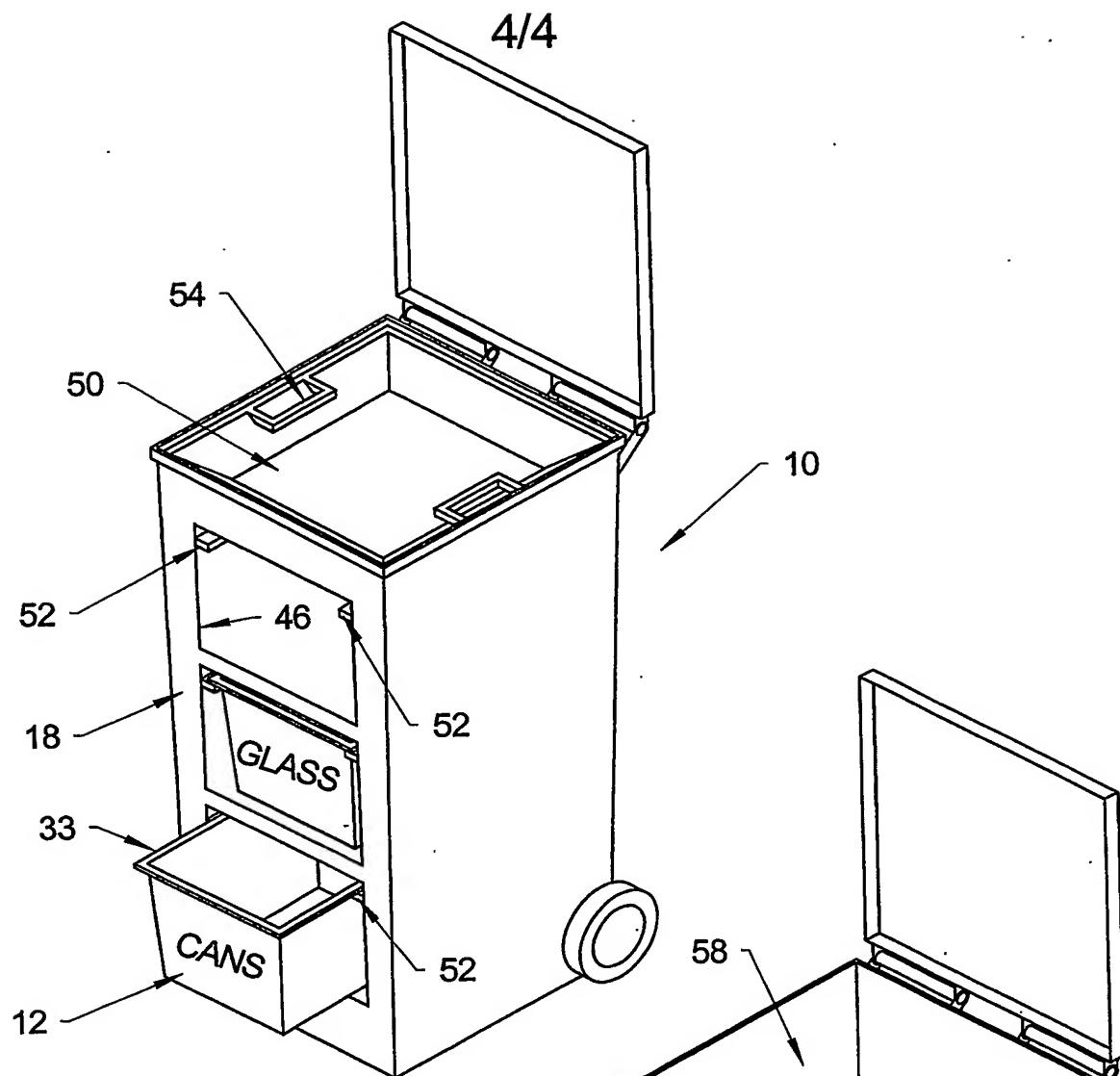


FIG. 8

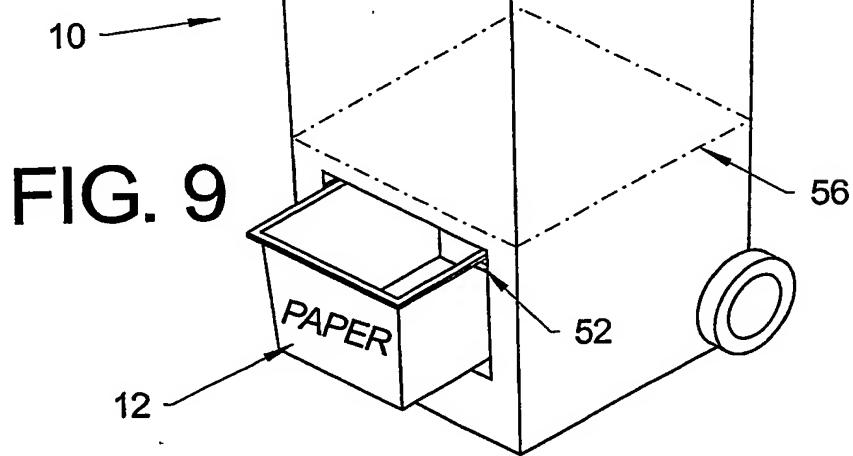


FIG. 9

PCT/GB2004/001689

